TITLE OF THE INVENTION

COMMUNICATION MEANS NOTIFICATION METHOD AND NOTIFICATION SYSTEM

BACKGROUND OF THE INVENTION

5 Technical Field

The present invention relates to communication systems wherein users communicate amongst themselves utilizing information terminals on a network carrying a plurality of communication means. More specifically, among such

10 communication systems, it relates to a communication system wherein users can select communication means ahead of initiating communication.

Description of Related Art

In recent years, various types of communication means

15 have been installed in information terminals on networks: telephone functions, email devices, instant messaging devices. Examples of this sort of information terminal include, for example, the PC (personal computer), WS (work station), portable telephones, and portable information

20 terminals used in PHS (Japan's personal handy-phone system, comparable to PCS, personal communications service in the United States). When communication is called for, users make use of the various types of communication means to suit their situations, circumstances or preferences.

Given this situation, when requesting communication it is necessary to consider the status or circumstances of the party from which communication is requested, not just the party requesting communication. In Laid-Open Patent Application 1995-250132 and Laid-Open Patent Application 1996-140158 a user registers the communication means he himself uses in advance. When a user requests communication with another user, notification occurs as to whether or not it is possible to communicate with a communication means registered by the other user.

Also, Laid-Open Patent Application 1998-55492 provides technology whereby a communication means usage possibility indication is dynamically modified according to changes in the communication means that a party can use, and before communication begins the party is notified of usable communication means. In this invention each user registers usable communication means for specified statuses in advance. Communication means usable by the user who is designated the communication destination (simply "destination user" hereinafter) are reported to the party requesting communication in accordance with that user's status.

All of the foregoing art displays only the destination user's usable communication means. Therefore the user who is sending a communication request (simply "source user"

hereinafter) to someone must search the other party's usable communication means for communication means which he himself can use. This puts a heavy burden on the user in matching the other party's circumstances when he wants to

5 communicate, and is troublesome and inconvenient for the user. Also, the destination user's usable communication means are not necessarily those that the source user can simultaneously use.

On the other hand, when the destination user does not

10 have the communication means that the source user wants to use, if the destination user does not download the communication means from a communication means provider, communication through that communication means cannot occur. Therefore the source user must use other communication means

15 and ask the destination user to install the desired communication means and have the destination user report completion of the installation. Expanding communication means when one wants to start communicating places a great burden on the user and interferes with smooth communication.

20 In addition, in recent years there have been many cases in which one user uses a plurality of user terminals and uses a plurality of terminals to suit the user's status. For example, a portable terminal is used while on the go, and different computers are used at the office and home.

25 Under these conditions, even if it is known that a

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communication means can or cannot be used at one terminal, if the same sort of information is not known for the communication means at another terminal it is difficult to perform communication that takes into account the other

5 party's status.

SUMMARY OF THE INVENTION

An object of the present invention is to consider the situation at both the source user end and the destination user end and display communication means usable at both

10 ends.

Another object of the present invention is to provide technology for performing communications wherein meanwhile the communication means are readily extended.

An additional object of the present invention is to

15 present communication means responsive to an environment in which one user uses a plurality of terminals.

In order to resolve the foregoing issues, the invention in a first aspect provides a communication means reporting method used in a communication system that selectively uses

20 communication means installed in information terminals in a network for users to communicate with each other; it comprises the steps of:

A.   Associating operable communication means in each user's information terminal with users, and storing this

25 information,

B.   Receiving a destination user designation from a source user requesting communication,

C.   Creating a list, based on the stored information, describing communication means that are operable at both the destination user's information terminal and the source user's information terminal, and

D.   Reporting the foregoing list to the source user before communication begins.

Usable communication means at each user's information terminal are associated with each user in advance, and that information is stored. When a source user specifies a destination user, a list of communication means which both parties can use is created based on the stored information. This list is sent to the source user's information terminal and displayed on a display, for example. The source user selects any of the communication means from the list, and communication with the specified destination user begins.

The invention in a second aspect provides a communication means notification system used in a communication system that selectively uses communication means installed in information terminals in a network for users to communicate with each other; it comprises a first table, administration means, designation means, acquisition means, creation means, and reporting means.

The first table associates communication means that are operable at each user's information terminal with users and stores that information. The administration means receives an operable communication means designation from a user and stores it in the foregoing first table. The designation means receives a destination user designation from the source user who is requesting communication. The acquisition means acquires communication means that are operable at both the source user's information terminal and the destination user's information terminal from the foregoing first table. The creation means creates, based on the acquired information, a list describing communication means usable by both the source user and the destination user. The reporting means reports the created list to the source user before communication begins.

Specifically, the source user specifies the destination user by some sort of means. Examples of specifying means include entering a telephone number, and selecting a user from a previously stored address book. The acquisition means acquires the communication means usable by both the source user and the destination user specified by the designation means respectively from the first table. The creation means creates a communication means list describing communication means that both the source user and destination user can use. The reporting means is structured

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using a WWW server and WWW browser, for example. The created communication means list is displayed in the WWW browser.

The invention in a third aspect provides a
5   communication means notification system for the foregoing second aspect, additionally comprising a second table and priority means. The second table associates communication means usable in a specified user status with users and user status, and stores this information. The priority means
10 receives settings for communication means usable in a specified user status and stores it in the second table.

In addition, in this system the foregoing first table stores user status in addition to communication means. The foregoing administration means receives the new user status
15 setting and writes the communication means usable in the new user status to the first table in accordance with the settings of the second table.

The first table stores communication means usable by each user at that time. Therefore it can create a list of
20 communication means that corresponds to dynamically changing user status.

The invention in a fourth aspect provides a communication means notification system for the foregoing second aspect, additionally comprising a second table and
25 priority means. The second table associates communication

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means usable in a specified user status and the foregoing

priority with users and user status, and stores this

information. The priority means receives communication means

usable in a specified user status and a priority setting for

5   the foregoing communication means and stores these in the

second table.

In addition, in this system the foregoing first table

stores communication means priority and user status in

addition to communication means. The foregoing

10   administration means receives the new user status setting

and writes the communication means usable in the new user

status and the communication means priority to the first

table in accordance with the settings of the second table.

The foregoing acquisition means acquires the communication

15   means usable by both the source user's information terminal

and the destination user's information terminal and the

communication means priority from the first table. The

foregoing creation means creates the foregoing list based on

the priority of communication means that both the source

20   user and destination user can use.

The user sets priorities in advance for specified

statuses for the communication means that he himself uses.

If the user status changes, the priority of that user's

communication means changes, so the administration means

25   updates the first table. The list of communication means is

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created based on the priority of communication means usable by originating and destination user, so it is possible to create a communication means list corresponding to dynamically changing user status.

5   The invention in a fifth aspect provides a communication means notification system for the foregoing fourth aspect in which the foregoing creation means reorders communication means in accordance with the source user's priority.

10   Communication means usable by both the source user and the destination user may have different priorities. In this case, the communication means list is reported in the source user's priority ranking.

The invention in a sixth aspect provides a

15   communication means notification system for the foregoing fourth aspect in which the foregoing creation means reorders communication means in accordance with the destination user's priority.

Communication means usable by both the source user and

20   the destination user may have different priorities. In this case, the communication means list is reported in the destination user's priority ranking.

The invention in a seventh aspect provides a communication means notification system for the foregoing

25   second aspect in which the foregoing designation means

receives designations using identification information that specifies operable communication means at the destination user's information terminal.

For example, if the communication means is IRC 5 (Internet Relay Chat), the identification information is a nickname. If the communication means is email, the identification information is an email address. If it's the telephone, it's a telephone number.

The invention in a eighth aspect provides a 10 communication means notification system for the foregoing second aspect in which the foregoing designation means is able to receive a destination user designation using identification information that specifies operable communication means at the destination user's information 15 terminal, and if both the destination user and the source user can use communication means corresponding to the foregoing identification information, the foregoing creation means describes the relevant communication means at the start of the list.

20 For example, the source user specifies the destination user by entering a telephone number. If both users can use the telephone, the creation means creates a list starting with the telephone, even if there are other usable communication means.

The invention in a ninth aspect provides a communication means notification system for the foregoing second aspect in which the foregoing designation means is able to receive a destination user designation using

5   identification information that specifies operable communication means at the destination user's information terminal, and if both the destination user and the source user can use communication means corresponding to the foregoing identification information, the system

10   additionally comprises a starting means for starting communication using the relevant communication means.

For example, the source user specifies the destination user by entering a telephone number. If both users can use the telephone, the starting means starts setting up a

15   communication line using the telephone, even if there are other usable communication means.

The invention in a tenth aspect provides a communication means notification system for the foregoing second aspect in which the foregoing communication means is

20   a game application in which a plurality of users can participate on a network.

Examples of game applications for a plurality of users to participate interactively on a network include, for example, mahjong games, interactive sports games, and the

25   like.

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The invention in a eleventh aspect provides a computer-readable recording medium recording a communication means reporting program used in an information terminal with a communication means installed for users to selectively

5   communicate with one another or used in an information terminal that can communicate with the foregoing information terminal; the foregoing communication means reporting program executes the following stages:

A.   Preparing a first table that associates operable

10   communication means in each user's information terminal with users, and stores this information,

B.   Receiving an operable communication means setting from a user and storing it in the foregoing first table,

C.   Receiving a destination user designation from a

15   source user requesting communication,

D.   Acquiring communication means that are operable at both the source user's information terminal and the destination user's information terminal from the foregoing first table,

20   E.   Creating a list, based on the acquired information, describing communication means usable by both the source user and the destination user, and

F.   Reporting the created list to the source user before communication begins.

This has the same sort of operating effect as the foregoing second aspect.

The invention in a twelfth aspect provides a communication means reporting method used in a communication system that selectively uses communication means installed in information terminals in a network for users to communicate with each other; it comprises the steps of:

A. Associating operable communication means in each user's information terminal with users, and storing this information,

B. Receiving a destination user designation from a source user requesting communication,

C. Creating a first list, based on the stored information, describing communication means that are operable at both the destination user's information terminal and the source user's information terminal,

D. Creating a second list describing communication means which are present at either the destination or source user's information terminal and not at the other, and which can be downloaded to the terminal that does not have the relevant communication means and can be executed at the terminal, and

E. Reporting a third list that combines the first list and the second list to the source user before communication begins.

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The first list describes communication means that both the originating and destination user have. The second list describes communication means that one has and the other doesn't. However, the communication means described in the second list are communication means that can be downloaded to the user terminal that does not have that communication means and can be executed at that terminal.

The invention in a thirteenth aspect provides a communication means notification system for the foregoing twelfth aspect in which the foregoing second list includes a description of communication means which neither the destination nor source user's information terminal has, and which can be downloaded to both terminals and can be executed at both terminals.

For example, neither the destination nor source user has videoconference means. However, if videoconference means can be downloaded to both terminals and can be executed at both terminals, videoconference means is also described in the second list.

The invention in a fourteenth aspect provides a communication means notification system for the foregoing twelfth aspect in which the foregoing download conditions for downloading communication means to a user's information terminal and execution conditions for executing communication means at a user's information terminal are

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stored in advance for each downloadable communication means, and the second list is created based on a user's information terminal's terminal information and download conditions and execution conditions.

5   Download conditions and execution conditions for downloadable communication applications are stored in advance in a database or the like. These include, for example, empty hard disk space required for downloading, memory needed for executing the application and the like.

10   The communication means that can be executed at the user terminal are determined from among the downloadable communication applications based on terminal information such as idle memory at the user's terminal and communication application download conditions and execution conditions.

15   The invention in a fifteenth aspect provides a communication means notification system for the foregoing twelfth aspect in which selection of any of the communication means on the third list is received from the source user and the selected communication means is reported

20   to the destination user's information terminal, and if the destination user's information terminal does not have the selected communication means, the destination user's information terminal acquires the selected communication means by downloading.

More specifically, a communication application is downloaded to the destination user's terminal according to the source user's selection. The user's consent may be obtained before executing the download.

5   The invention in a sixteenth aspect provides a computer-readable recording medium recording a program for executing the communication means reporting methods set forth in the foregoing twelfth through fifteenth aspects. It achieves the same sort of operating effect as the

10   foregoing twelfth through fifteenth aspects.

The invention in a seventeenth aspect provides a communication means notification system used in a communication system that selectively uses communication means installed in information terminals in a network for

15   users to communicate with each other; it comprises a first table, a designation means, a first creation means, a second creation means, and a reporting means.
The first table associates operable communication means in each user's information terminal with users, and stores this

20   information. The designation means receives a destination user designation from a source user requesting communication. The first creation means creates a first list, based on the stored information, describing communication means that are operable at both the

25   destination user's information terminal and the source

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user's information terminal. The second creation means

creates a second list describing communication means which

are present at either the destination or source user's

information terminal and not at the other, and which can be

5   downloaded to the terminal that does not have the relevant

communication means and can be executed at the terminal.

The reporting means reports a third list that combines the

first list and the second list to the source user before

communication begins.

10   This achieves the same sort of operating effect as the

foregoing twelfth aspect.

The invention in an eighteenth aspect provides a

communication means supply device used in the communication

means notification system of the foregoing seventeenth

15   aspect. This device comprises a creation means and a supply

means. The creation means creates a list of communication

means that can be downloaded to an information terminal and

can be executed at the information terminal for destination

users and source users respectively. The supply means

20   supplies communication means included in the foregoing list

to user information terminals.

The second list of the foregoing twelfth aspect is

created based on the list created by this device. Also, in

the twelfth aspect the communication means which the source

user selects from the third list is supplied to the source

user by this device.

The invention in a nineteenth aspect provides a

communication means reporting method used in a communication

5   system that selectively uses communication means installed

in information terminals in a network for users to

communicate with each other; it comprises the steps of:

A.   Associating operable communication means in each

user's single information terminal or plurality of

10 information terminals and terminal identification

information identifying the user's information terminals

with users, and storing this information,

B.   Receiving a destination user designation from a

source user requesting communication,

15 C.   Creating a list, based on the stored information,

describing communication means that are operable at both the

destination user's information terminal and the source

user's information terminal, and

D.   If a plurality of the same communication means is

20 included in the foregoing list, adding information for

identifying the information terminals to the foregoing list

and reporting the foregoing list to the source user before

communication begins.

For example, if the list includes telephone at the

25 office and telephone at the lab, the list should display

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"telephone @ office" and "telephone @ lab" respectively in order to distinguish them.

The invention in a twentieth aspect provides a communication means reporting method for the foregoing

5　nineteenth aspect in which a user-set message corresponding to a communication means in an information terminal is stored together with a communication means and information terminal, and a message set by the destination user is additionally included in the list reported to the source

10　user.

Examples of messages include "I'm here" and "Busy." By reporting the communication means along with a message the destination user can easily indicate his own status or desire, and this encourages smooth communication.

15　The invention in a twenty-first aspect provides a communication means reporting method for the foregoing nineteenth aspect in which the foregoing communication means operable at the same user's single information terminal or plurality of information terminals are grouped by

20　predetermined criteria, and the foregoing list is created based on the grouped communication means, and the communication means described in the foregoing list are grouped using the foregoing predetermined criteria and reported to the source user before communication begins.

For example, communication means are grouped for each

category of communication means. In this case, the

communication means list reported to the source user is also

grouped for each category of communication means.

5   Categories of communication means include telephone,

messaging, file transfer, and the like.

The invention in a twenty-second aspect provides a

communication means reporting method for the foregoing

twenty-first aspect in which a priority ranking is set for

10   each group in the foregoing communication means, and the

foregoing list is created based on the priority ranking.

For example, the list describes only each group's highest

priority communication means.

The invention in a twenty-third aspect provides a

15   communication means reporting method for the foregoing

twenty-second aspect in which the foregoing priority ranking

is set based on the sequence in which communication means

became usable inside a group.

For example, the priority ranking of the communication

20   means most recently used within a group is "1."

The invention in a twenty-fourth aspect provides a

communication means reporting method for the foregoing

twenty-second aspect in which a recommended communication

means is set for each source user in each group of the

25   foregoing communication means, and the priority ranking of

communication means for each source user is modified and the foregoing list is created. The priority ranking of communication means desired is modified for each source user.

5   The invention in a twenty-fifth aspect provides a communication means reporting method for the foregoing twenty-first aspect in which selection of any group based on the foregoing list is received from the source user, and an attempt is made to communicate with the destination user's

10   communication means included in the selected group.

For example, if telephone is selected, all of the destination user's telephones are called, and communication begins with the telephone that answers.

The invention in a twenty-sixth aspect provides a

15   communication means reporting method for the foregoing twenty-first aspect in which selection of any group based on the foregoing list is received from the source user, an inquiry is made to the destination user's communication means included in the selected group as to whether it's

20   receiving or not, and communication begins with the communication means in the destination user's information terminal that is first to respond.

For example, if telephone is selected, a reception confirmation is sent to all of the destination user's

telephone terminals, and communication begins by telephone with the first terminal to respond.

The invention in a twenty-seventh aspect provides a computer-readable recording medium recording a program for executing the communication means reporting methods of any of the foregoing nineteenth through twenty-sixth aspects. This recording medium achieves the same sort of operating effect as the foregoing nineteenth through twenty-sixth aspects.

The invention in a twenty-eighth aspect provides a communication means notification system used in a communication system that selectively uses communication means installed in information terminals in a network for users to communicate with each other; it comprises a first table, a designation means, a creation means, and a reporting means.

The first table associates operable communication means in each user's single information terminal or plurality of information terminals and terminal identification information identifying the user's information terminals with users, and stores this information. The designation means receives a destination user designation from a source user requesting communication. The creation means creates a list, based on the stored information, describing communication means that are operable at both the

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destination user's information terminal and the source

user's information terminal.   If a plurality of the same

communication means is included in the foregoing list, the

reporting means adds information for identifying the

5   information terminals to the foregoing list and reports the

foregoing list to the source user before communication

begins.

This achieves the same sort of operating effect as the

foregoing nineteenth aspect.

10   From the following detailed description in conjunction

with the accompanying drawings, the foregoing and other

objects, features, aspects and advantages of the present

invention will become readily apparent to those skilled in

the art.

15   BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an overall structural view of notification

system in accordance with first embodiment;

Fig. 2 is a block diagram showing functional structure

of notification device;

20   Fig. 3 is a block diagram showing functional structure

of user terminal with notification device;

Fig. 4 is a conceptual diagram explaining user table in

user DB 13;

Fig. 5 is a conceptual diagram explaining preference

25   table in user DB 13;

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Fig. 6 is a conceptual diagram explaining information in list DB 2;

Fig. 7 is an example of a candidate list display (1);

Fig. 8 is an example of a candidate list display (2);

Fig. 9 is an example of a candidate list display (3);

Fig. 10 is an example of a candidate list display (4);

Fig. 11 is an example of a candidate list display (5);

Fig. 12 is a example of user information setting window;

Fig. 13 is a flowchart showing one example of flow of processing performed by notification device;

Fig. 14 shows basic principles of a notification system in a third embodiment;

Fig. 15 is a functional block diagram of the notification system in the third embodiment;

Fig. 16 diagrams process flow in the third-embodiment notification system;

Fig. 17 is an example of a candidate list display in the third embodiment;

Fig. 18 shows basic principles of a notification system in a fifth embodiment;

Fig. 19 is a functional block diagram of the notification system in the fifth embodiment;

Fig. 20 is a conceptual diagram illustrating data stored in candidate DB;

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Fig. 21 is a conceptual diagram illustrating data stored in group DB;

Fig. 22 is a conceptual diagram illustrating a message list;

5 Fig. 23 is a conceptual diagram illustrating data stored in contents DB;

Fig. 24 diagrams process flow in the fifth-embodiment notification system;

Fig. 25 diagrams process flow in a confirmation routine 10 in the fifth-embodiment notification system;

Fig. 26 diagrams process flow in a communication status broadcast routine in the fifth-embodiment notification system;

Fig. 27 diagrams process flow in a communication 15 contents acquisition routine in the fifth-embodiment notification system; and

Fig. 28 diagrams process flow in a communication acquisition log routine in the fifth-embodiment notification system.

20 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Next, a communication means notification system in accordance with the present invention shall be described in detail while presenting embodiments.

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First Embodiment

Configuration

Fig. 1 is a drawing showing the overall structure of a
notification system in accordance with the first embodiment.
5   In this notification system, a notification device 1, list
DB 2, DBMS (Data Base Management System) 3, and user
terminals 4a, b, c, and d are connected via a network 5.

The notification device 1 is both: (1) provided in a
user terminal; and (2) provided in a server terminal. This
10   embodiment is an example in which the foregoing (1) and (2)
notification devices 1 are intermixed. In Fig. 1 user
terminals 4a and b do not have notification device 1
installed, and user terminals 4c and d have notification
device 1 installed. User terminals 4a and b are portable
15   phones or PHS, for example. User terminals 4c and d are a
PC or WS, for example.

Also, in the case of the notification device 1 for the
latter instance (2), one notification device 1 can provide
centralized administration for many server terminals, or a
20   plurality of notification devices 1 provided in a plurality
of server terminals a and b respectively can provide
diversified administration. Fig. 1 shows the latter
structure with diversified administration.

The DBMS 3 and the list DB 2 may be connectable with
25   the notification device 1 on the network. For example, the

DBMS **3** and the list DB **2** may be in an information terminal

operated by the notification device **1**, or in another

information terminal. The DBMS **3** and the list DB **2** are

usually provided in a one-to-one relationship with a

5   plurality of notification devices **1**, but a plurality may

also be provided.

In Fig. 1 the notification devices **1a** and **1b** are

provided in a one-to-one relationship with the lists DB **2a**

and **2b** and the DBMS **3a** and **3b** respectively. The list DB **2a**

10   and **2b** store specific information related to user terminals

under the administration of the notification devices **1a** and

1b respectively. In other words, specific information

pertaining to the user terminals **4a, b, c,** and **d** is

dispersed and stored in the list DB **2a** and **2b**.

15   Network **5** can be the Internet or an Intranet, a mobile

communications network or the like.

(1) Notification Device

Fig. 2 is a block diagram showing the functional

structure of the notification device **1** and a user terminal

20   that does not have a notification device **1**. Fig. 3 is a

block diagram showing the functional structure of a user

terminal that has a notification device **1**. The notification

device and user terminal have the same functions in both

Fig. 2 and Fig. 3, so the structure of the notification

25   device **1** shall be explained using Fig. 2.

The notification device 1 in Fig. 2 has an address DB 11, address administration module 12, user DB 13, receiving module 14, display module 15, acquisition module 16, creation module 17, WWW server 18, and communications module 19. Furthermore, the address administration module 12, receiving module 14, display module 15, acquisition module 16, and creation module 17 are external programs of the WWW server 18, and are linked to the WWW server 18 and operated via a CGI (Common Gateway Interface) or in a library format. Other interface programs may be used instead of CGI for the interface program between these external programs and the WWW server 18.

An address book is stored in the address DB 11. The address book (not shown in drawing) associates and stores the names and user IDs of each user's friends and acquaintances. A user ID is authorization information for universally specifying a user in the notification system.

The address administration module 12 writes to and reads from the address book according to instructions from a user terminal. Contents read by the address administration module 12 are sent to the WWW server 18 and displayed at the user terminal using a WWW browser 42 to be described later. The address DB 11 and the address administration module 12 are not always required, but if provided they are convenient when the user specifies the destination user.

The user DB **13** stores specific information pertaining to users. Fig. 4 is a diagram giving a conceptual explanation of a user table stored in the user DB **13**. The user table stores user ID, user name, user status, communication means, whether or not the communication means is usable, attribute information, and communication conditions. This information is user information corresponding to user terminals **4a** and b, which do not have a notification device **1**.

"User ID," like the user ID in the address book, is identification information for universally specifying a user in this system.

"User name" describes the name of the user corresponding to user terminals **4a** and b, which do not have a notification device **1**.

"User status" describes the latest user status of each user. User status is selectively set from predetermined statuses. Examples of specified statuses are "online," "busy," "away," and "offline." User status can be entered by the user or automatically detected by any of other means and set. For example, Fig. 4 shows that the status of user "Taro Suzuki" is "online," and the status of "Hanako Yamada" is "busy."

"Communication means" describes the operable communication means at each user's terminal. For example,

Fig. 4 shows that communication using email, chat, instant message, telephone, and videoconference is possible at the terminal of user "Taro Suzuki." Furthermore, chat is a communication means in which a plurality of users share the same virtual channel, and can send and receive text messages in real time. Instant message is a communication means in which user terminals can send and receive text messages in real time on a one-to-one basis.

Communication means are not particularly limited; in addition to the foregoing they may include any communication means that can be installed in an information terminal, such as FTP (File Transport Protocol) devices, game applications, and the like. It is also possible to list communication means that cannot be used on the terminal at that point in time, or applications that are usable through downloading from the network. In the following explanation, this sort of application is simply referred to as a downloadable application.

"Usable?" describes whether or not a communication means in a user's terminal is usable or not, in accordance with user status; it may be described as either usable or not. For example, Fig. 4 shows that user "Taro Suzuki" can communicate using email, chat, instant message, and telephone, and cannot communicate using videoconference.

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"Attribute information" can store optional information pertaining to the communication means. For example, in Fig. 4 it stores text data showing where the communication means is used. Also, a user can list a text message that he wants to report to his selected destination as attribute information.

"Communication conditions" store the communication conditions necessary for beginning communication when actually using the communication means operating at the user terminal. Examples of communication conditions include communication address, transmission rate, and the like.

In addition to the foregoing information, it is possible to store other information in the user table as required, of course. For example, a terminal name for identifying the user terminal can be stored.

Fig. 5 is a diagram giving a conceptual explanation of a preference table stored in the user DB **13**. The preference table associates and stores user ID, user name, communication means, user status, and priority.

"User ID," "user name," and "communication means" describe the same contents as the contents of the user table shown in the foregoing Fig. 4.

"User status" and "priority" store the specified user status and the priority of the communication means in that status in accordance with user settings. For example, in

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Fig. 5 "Taro Suzuki" has set priority "2" in the status

"online" for the communication means "email," and has set

priority "1" for other statuses. Also, he has set priority

"1" in the status "online" for "instant message." Fig. 5

5   shows that the priority of communication means for "Taro

Suzuki" in "online" status is as follows.

  Priority 1: Instant messaging

  Priority 2: Email, chat, telephone

  Priority 3: Videoconferencing

10   Furthermore, in this embodiment any of "1," "2," or "3"

can be set as priorities.

  The receiving module **14** receives settings for the user

table or preference table from the user terminal, and stores

them in each table in the user DB **13**. If a user status is

15   stored in the user table, the receiving module **14** decides

whether or not a communication means corresponding to the

user status can be used, and updates "usable?" Also, when a

user status or communication means recorded in the user

table changes, the receiving module **14** updates the list DB **2**

20   (to be described later) in accordance with the preference

table. As described later, this is because the list DB **2**

stores whether or not a communication means can be used at

each user's terminal and its priority in accordance with the

latest user status.

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The display module **15** receives a user ID specified as a destination from the user terminal via the WWW server **18**, and reports it to the acquisition module **16**. The display module **15** also sends the user terminal a communication means candidate list created by the creation module **17** via the WWW server **18**. As described later, this communication means candidate list lists communication means that both the source user and destination user can use.

The acquisition module **16** receives the destination user's user ID from the display module **15**, and if it is a user ID within the local server terminal, reports it to the DBMS **3**; if the ID is not in the local server terminal, acquisition module **16** reports this to the server terminal having jurisdiction. Also, the acquisition module **16** receives a candidate list of communication means usable by the destination user (hereinafter "destination candidate list") from the DBMS **3** in the local server terminal or in the server terminal that is administering the destination user's information, and sends it to the creation module **17**.

The creation module **17** determines the communication means that the source user can use, based on the user table and preference table, and creates a communication source candidate table in which these communication means are listed. Next, the creation module **17** creates a candidate list listing the communication means that the source user

and destination user can use, based on the communication

destination and communication source candidate lists. The

creation module **17** can also rearrange the communication

means on the candidate list based on communication source

5 and communication destination priority.

The WWW server **18** receives the communication means

candidate list from the display module **15**, and sends it to

the WWW browser **42** at the source user's terminal. The WWW

server **18** also receives the address book from the address

10 administration module **12**, and sends it to the WWW browser **42**

at the user terminal. It should be understood that instead

of the WWW server **18** it is also possible to provide an

application for a specialized notification device that has

the same function, and supply the candidate list or address

15 book to the user terminal.

The communications module **19** receives from the source

user terminal the results of selecting communication means

from the candidate list. The communications module **19** reads

the selected communication means' communication conditions

20 from the user table for the source user. Next, the

communications module **19** reports the necessary settings to

the notification device **1** administering the source user's

terminal. Necessary settings include transmission rate

adjustments, acquisition of participation channel names, and

25 acquisition of intercommunication addresses. In addition,

the communications module **19** reports the necessary settings

to the user terminal. Subsequently, the user terminal

activates the communication means using the set

communication conditions and communication begins.

5   (2) List DB and DBMS

Fig. 6 is a diagram giving a conceptual explanation of

the information stored in the list DB **2**. The list DB **2**

associates and stores user ID, user name, status,

communication means, usable?, priority, and attribute

10   information. "User ID," "user name," "user status,"

"communication means," "usable?," and "attribute

information" match the same information in the user table in

the user DB **13**.

"Priority" describes priority in accordance with user

15   status, based on each user's preference table. For example,

Fig. 6 is set to show an example in which the status of user

"Taro Suzuki" is "online"; the priority of each

communication means is displayed based on the contents of

the preference table.

20   Furthermore, in addition to the previously described

information, other information as required can be stored in

the list DB **2**, of course.

The DBMS **3** reads and writes the list DB **2**.

Specifically, when the DBMS **3** receives a new user status or

25   new communication means setting from the foregoing receiving

module **14** in the notification device **1**, it updates the list

DB **2** based on that information. Also, when a user ID is

received from the acquisition module **16**, the DBMS **3** searches

the list DB **2** using the user ID as a key, and sends the

5 acquisition module **16** usable communication means and their

status for the relevant user. Of course, DBMS **3** can also

search the list DB **2** using information other than user ID,

such as user name, as the key.

(3) User Terminal

10 The user terminals **4a** and **4b** have a settings module **41**,

WWW browser **42**, input/output module **45**, startup module **43**,

and communication application **44**.

The settings module **41** receives input of specified user

information, and sends it to the notification device **1**.

15 User information is information set in the user table or

preference table. The settings module **41** can also

automatically detect user status from among user information

by a predetermined method. Also, the settings module **41**

displays a previously prepared window in input/output module

20 **45**, and receives input of the foregoing user information.

This window shall be described later.

The WWW browser **42** sends address book display requests

to the notification device **1**, and outputs the address book

sent in response to the foregoing request to the

25 input/output module **45**. The WWW browser **42** also receives

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the candidate list from the notification device **1**, and displays it in the input/output module **45**. Furthermore, a display application specialized for a notification device can be installed at the user terminal instead of the WWW browser **42**.

The startup module **43** reports the communication means selected from the candidate list displayed at input/output module **45** to the notification device **1**. The startup module **43** also receives communication conditions from the notification device **1**. Next, the startup module **43** transfers the communication conditions to the communication application **44** corresponding to the selected communication means, and starts the communication application **44**. Examples of the communication application **44** include email devices, chat clients, instant messaging devices, and FTP devices. Starting the communication application **44** begins communication between the destination user and the source user.

(4) Notification Device in User Terminal

Fig. 3 is a block diagram showing the functional structure of the notification device **1** and user terminals **4c** and d when the notification device **1** is provided in the user terminal. With the exception of providing a display control module **46** instead of the WWW server **18** and the WWW browser

42, the configuration is likewise as with the notification

device **1** and user terminal in Fig. 2.

The display control module **46** has functions combining

the WWW server **18** and the WWW browser **42**. That is, the

5 display control module **46** outputs the address book sent from

the address administration module **12** and the candidate list

sent from the display module **15** to the input/output module

45.

Furthermore, if the notification device **1** is provided

10 in the user terminal, only information relating to the user

using the user terminal is stored in the address book, user

table, and preference table.

Screen Examples

(1) Candidate List Display Example

15 Fig. 7-11 are examples of displaying candidate lists of

communication means displayed at the user terminal in this

embodiment of a notification system.

Fig. 7 is an example of a candidate list displayed when

the source and destination user's user terminals are

20 connected to a network, i.e., are online. In the picture,

the information terminal name "SubPC" is displayed after the

"@" mark in the list of communication means.

In addition, the information attribute "(for Office)"

is displayed after the information terminal name.

25 Downloadable communication means are displayed in italics.

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The display method that is "downloadable" is displayed only when downloadable functions are present, and when this function is selected a list of downloadable applications is displayed. Also, as shown in Fig. 7, 8, 10, and 11, the list of downloadable applications may be displayed with the usable communication means.

Fig. 8 is an example of the candidate list displayed when the source user is online and the destination user terminal is disconnected from the network, i.e., is offline. The displayed communication means are only the communication services provided by the server.

Fig. 9 shows a display example when attribute information is not displayed and only the communication means are displayed.

Fig. 10 is a display example when one user has a plurality of information terminals and the display distinguishes among the respective information terminals. For example, in Fig. 10 the source user has the two user terminals "SubPC" and "PC," and can do file transfer at the respective terminals.

Fig. 11 is a screen example showing a display example of other attribute information. The message "Please send here" is displayed after the communication means as attribute information.

(2) User Information Setting Window

Fig. 12 is an example of a window for inputting user information at the user terminal. A terminal name setting column **121**, communication means setting column **122**, status setting button **123**, disable button **124**, and comment column **125** are displayed in Fig. 12.

The terminal name setting column **121** is a field for setting the user terminal name for identifying user terminals.

The communication means setting column **122** is a field for setting operable communication means at the user terminal displayed at the terminal name setting column **121**.

The status setting button **123** is a button for setting whether or not the communication means displayed in the communication means setting column **122** is usable; it is set for each status. In the picture, "FileTransfer" is set to be usable in the statuses "online," "away," and "offline." Conversely, "FileTransfer" is set so it cannot be used in "busy."

The disable button **124** is a button used when the user wants to avoid communicating using a communication means displayed in the communication means setting column **122**. When this disable button **124** is pressed, communication using the relevant communication means is set as impossible, regardless of the setting status of the status setting button **123**.

The comment column **125** is a field for setting attribute information. The picture shows an example in which the message "Please send here" is set as attribute information.

The user information setting window is preferably designed to enable setting required information other than the user information described above, in accordance with the configuration of the user table and the preference table.

Process Flow

Next, the flow of processing performed by the foregoing notification device 1 shall be specifically explained. Furthermore, in order to simplify the explanation, a case in which the notification device **1** is not provided in a user terminal (Fig. 2) shall be explained, but the same sort of processing is performed when it is provided in a user terminal (Fig. 3). The following process begins when a user terminal requests display of an address book.

In step S1 the address administration module **12** reads the address book from the address DB **11** and sends it to the user terminal via the WWW server **18**. At the source user's terminal, the WWW browser **42** displays the received address book on the screen.

In step S2 the selection by the source user of any user as the destination user causes the display module **15** to acquire the user ID of the selected user via the WWW server **18**. Step S3 subsequently ensues.

In step S3 the display module **15** sends the destination user's user ID to the acquisition module **16**. The acquisition module **16** sends the user ID to the DBMS **3**, and requests the list of communication means that the destination user can use, i.e. the destination candidate list.

The DBMS **3** searches the list DB **2** with the user ID as the key, and sends the acquisition module **16** the relevant user's usable communication means and their priority. The acquisition module **16** sends the acquired destination candidate list to the creation module **17**.

In step S4 the creation module **17** reads the source user's usable communication means and each communication means' priority in the source user status from the user DB **13** and creates the originating candidate list.

In step S5 the creation module **17** creates a communication means list for sending to the display module **15**. Specifically, the creation module **17** determines communication means that can be used by both the destination user and the source user from the originating candidate list and the destination candidate list. Next, the determined communication means are reordered in the source user's priority ranking and become the candidate list.

In step S6 the creation module **17** sends the candidate list to the display module **15**. The display module **15** sends

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the candidate list to the user terminal via the WWW server
18. The candidate lists exemplified by the foregoing Fig.
7-11 are displayed by the WWW browser **42** at the user
terminal.

5   Subsequently, the communication means selected by the
source user is reported from the startup module **43** to the
communications module **19.** Based on the user table, the
communications module **19** negotiates with the notification
device **1** administering the destination user terminal and
10   decides the communication conditions. The startup module **43**
transfers the communication conditions to the communication
application **44,** and starts the communication application **44.**

In this embodiment before beginning communication with
another user, the user reports the communication means that
15   are mutually usable in the status at that point in time.
Moreover, the communication means display can be made to
reflect the circumstances of the source user, such as
priority ranking and the like. Therefore the user who is
trying to communicate can decide to enable communication
20   that takes into account not just the other party's status
but also his own circumstances.

Second Embodiment

In the foregoing first embodiment the destination user
was selected by selecting any user in the address book. The
25   selected user is specified using the user ID. However,

destination user selection and designation can also be done by other methods.

For example, with a portable telephone an incoming call list in which incoming-call telephone numbers are noted is routinely prepared. There are also instances in which a telephone book created by a user or a list of mail addresses is stored in the user terminal. It is also possible to indicate a destination using this information. The following sort of processing is possible in such cases.

First, the user's communication address is also stored in the list DB 2. When a destination user is selected using any communication address or user name, the display module 15 acquires the user name or communication address and transfers it to the acquisition module 16 and the DBMS 3. However, the display module 15 also transfers an identifier indicating what the transferred information is. For example, a telephone number is transferred along with an identifier indicating that it is a telephone number.

The DBMS 3 searches the list DB 2 with a communication address, for example, as the key, and as described previously sends the destination candidate list to the acquisition module 16. Subsequent processes are the same as described previously.

Also, before searching the list DB 2, the display module 15 should search the address book and find the user

ID, and may be set such that it will search the list DB **2**
only if the user ID is not found.

In addition, if the communication means corresponding
to the communication address used in designating the

5   destination user is included in the created candidate list,
the creation module **17** may display the relevant
communication means at the start of the candidate list.
Also, in this case, the startup module **43** may automatically
start the relevant communication means without waiting for

10 selection of a communication means by the user.

This embodiment enables a user to select the
destination user using information usually stored at the
user terminal side, which increases the convenience of the
system even more.

15 **Third Embodiment**

Next, a notification system that begins communication
by downloading a communication means when the source user
terminal and/or the destination user terminal do not have
that communication means shall be described in detail.

20 *Outline*

Fig. 14 is an explanatory view illustrating principles
of a notification system in this embodiment. This
notification system has a communication administration
module **121**, designation module **123**, acquisition module **124**,

25 display module **126**, selection module **127**, downloading module

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128, candidate administration module **131**, and candidate DB

132. The candidate DB **132** is equivalent to the list DB in

the foregoing Fig. 2.

A communication means useable at a user terminal is

5   reported from the communication administration module **121** to

the candidate administration module **131**, and stored in the

candidate DB **132**. When a user specifies a destination user,

a list ("α-list" below) of communication means useable by

the destination user is sent from the candidate

10 administration module **131** to the acquisition module **124**, and

displayed at the user terminal by the display module **126**.

If a communication means that a certain user terminal does

not have is selected, the user terminal that does not have

that communication means downloads the communication means

15 using the downloading module **128**. By doing so, the selected

communication means is started at both user terminals, and

communication begins.

By utilizing this notification system, when a user

terminal does not have the selected communication means that

20 communication means is downloaded to the user terminal.

Therefore the user can begin communication using the desired

communication means.

Configuration

Fig. 15 is a functional block diagram showing the

25 structure of a notification system in accordance with the

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third embodiment.　This notification system **110** consists of

a user terminal **120,** server **130,** and communication means

archive **140** connected by a network such as the Internet.

Furthermore, the drawing shows only one user terminal, but a

5　plurality of user terminals is connected to the server.

　　　The user terminal has a communication administration

module **121,** terminal administration module **122,** designation

module **123,** acquisition module **124,** creation module **125,**

display module **126,** selection module **127,** and downloading

10　module **128.**　The communication administration module **121**

reports communication means that the user terminal has to

the server.　The communication administration module **121**

also receives a report of the communication means selected

by the source user and starts that communication means.　The

15　terminal administration module **122** reports memory amount or

Java™ version, for example, to the server.　The designation

module **123** receives the destination user designation from

the user and reports it to the server.

　　　The acquisition module **124** acquires the α-list of

20　useable communication means at the user specified as the

destination from the candidate administration module **131.**

The creation module creates a list of communication means

that both users can use (hereinafter "candidate list") from

a ß-list of communication means that the source user can use

25　and the α-list acquired from the server.　The display module

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126 displays the candidate list at the user terminal. The

selection module **127** reports the communication means

selected from the candidate list to the candidate

administration module **131**. The downloading module **128**

5 acquires a communication means that the user terminal does

not have from a communication means supplier.

The server has the candidate administration module **131**,

candidate DB **132**, and terminal DB **133**. The candidate

administration module **131** stores communication means

10 operable at each user terminal in the candidate DB **132** and

stores each user terminal's terminal information in the

terminal DB **133**. Information stored in the candidate DB **132**

is the same as the information in the list DB shown in the

foregoing Fig. 6; at the very least, information specifying

15 the user, communication means, and "useable?" are stored.

The candidate administration module **131** also acquires

communication means useable by the specified destination

user from the candidate DB **132** and reports this to the

source user terminal. In addition, the candidate

20 administration module **131** searches the communication means

archive for communication means that can be downloaded to

the destination user terminal, and writes these to the α-

list.

The communication means archive has a table of

25 correspondences and a program DB. Contained in the

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for downloading communication means to a terminal, and the execution conditions necessary for executing the communication means at the terminal. For example, it can list the terminal memory amount necessary for downloading or executing a communication means. The program DB stores an execution format of the communication means, i.e. a communication application.

Process Flow

Fig. 16 is a drawing illustrating the process flow in a notification system with the foregoing configuration when the destination user terminal downloads a communication means.

When starting, the user terminal reports communication means the user terminal has to the server (#11, #12). Also, if a usable communication means becomes unusable or an unusable one becomes usable, the user terminal reports that change to the server (#11, #12). As was the case in the foregoing first embodiment, switching communication means between usable and unusable may be done automatically by the user terminal to correspond to changes in user status, or may be done by user input.

In addition, when starting, the user terminal reports specified terminal information to the server (#11, #12). This terminal information, as described later, is information used for deciding whether or not a communication

means can operate at a user terminal. For example, if a user terminal receives a Java™ applet, the Java™ version and memory amount are reported to the server.

The server receives communication means and terminal information (#13), and writes it to the candidate DB **132** and the terminal DB **133** (#14). When the server receives a change in communication means usable/unusable status from the user terminal, the details thereof are written to the candidate DB **132**. In this way the candidate DB **132** stores the latest information about whether or not a communication means at a terminal is usable.

If a user specifies a destination user after the user terminal starts (#15), the server reads the destination user terminal's terminal information from the terminal DB **133** (#16, #17). Specifying the destination user may be done using a WWW server and WWW browser in the same manner as in the foregoing first embodiment. This may also be done by inputting the user name or a user ID previously attached to the user.

The server searches for communication means that can be executed at that terminal, based on the destination user's terminal information and the correspondence table in the communication means archive (#18). The server also refers to the candidate DB **132** and creates a list of usable communication means at the destination user's terminal. In

communication means at the destination user's terminal. In addition, the server also creates the α-list, to which is added the foregoing communication means search results and useable communication means in the candidate DB **132**, and

5   sends it to the source user terminal (#19).

Upon receiving the α-list, the source user terminal creates the ß-list of useable communication means from among the communication means at the local terminal, and extracts communication means that are on both the α-list and the ß-

10 list and creates the candidate list (#20, #21). The candidate list is displayed at the user terminal (#21). If any of the communication means on the candidate list is selected, the selected communication means is reported to the server. Presently, a communication means that the

15 source user terminal has and the destination user terminal does not yet have but which can be downloaded and executed is selected.

When the communication means is selected, the communication means and conditions necessary for

20 communication are both reported to the server. The conditions are data transfer rate or the server name used in communication, for example. Also, the selected communication means is started at the source user terminal (#23).

#25). The destination user terminal downloads the communication means—that is, a communication application—from a communication means supplier, and starts it (#26, #27, #28). In this way communication begins between the source user terminal and the destination user terminal using the selected communication means.

Furthermore, before downloading the communication means to the destination user terminal, the user terminal can carry out a confirmation process with the user. For example, when the user terminal receives a report of a communication means from the server, it displays a screen message such as "User A requests communication using BBB. Do you want to download it?" Then, depending on the user's response to this message, the download is executed or interrupted. If the download is interrupted, the reason therefor should be reported to the source user terminal via the server.

Screen Example

Fig. 17 is an example of a candidate list displayed on a user terminal in the foregoing notification system. In Fig. 17(a), communication means that the destination user terminal does not have but which can be executed if downloaded are initially displayed as "downloadable." Then, when "downloadable" is selected, the executable communication means are individually displayed.

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when "downloadable" is selected, the executable

communication means are individually displayed.

In Fig. 17(b) the communication means that can be

executed at the destination user terminal are displayed

5 along with communication means that already exist. However,

"downloadable" is displayed after the communication means

name, making it possible to identify communication means

that haven't been installed yet. Here it is also possible

not to have the description "downloadable." In this case,

10 as in Fig. 7 in the foregoing first embodiment, the

downloadable communication means can be displayed in

italics, and do not need a description to distinguish them

from other communication means.

Fourth Embodiment

15 (A) In the foregoing third embodiment, the user

terminal merges the α-list of communication means that the

destination user can use and the ß-list of communication

means that the source user can use. However, this

processing can also be done by the server. In that case,

20 providing a creation module at the user terminal is

unnecessary.

(B) In the foregoing third embodiment, both a

correspondence table and a program DB are provided in the

communication means archive. However, they may be provided

25 separately, or may be provided in the server.

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(C) In explaining the foregoing third embodiment, the
case in which the source user terminal already had the
communication means, and the destination user terminal did
not have it but the source user selected an executable

5　communication means, was described. However, the same sort
of processing can be done in the opposite situation.

It is also possible for the candidate list to describe
communication means that neither the source user nor the
destination user terminal has. In such a case, for example,

10　the source user terminal sends its local terminal
information to the communication means archive and obtains a
list of executable communication means. The source user
terminal adds useable communication means that it already
has at the local terminal and creates the ß-list. In

15　addition, the source user terminal creates the candidate
list from the shared parts of the α-list sent from the
server and created the ß-list.

However, there is a possibility that the number of
types of communication means executable at both user

20　terminals is very large. Therefore a priority ranking
should be applied to the communication means in advance, and
the communication means should be displayed as the candidate
list in priority ranking sequence up to a specified rank.
It would then be possible to display lower-ranked

25　communication means by user request.

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Fifth Embodiment

Next, a notification system that correlates and administers communication means when a single user has a plurality of terminals shall be explained in detail.

5 *Outline*

Fig. 18 is an explanatory view illustrating principles of a notification system in this embodiment. With the exception of not having the downloading module **128**, this notification system has functions like the notification

10 system of the third embodiment. That is, this notification system has communication administration module **121**, designation module **123**, acquisition module **124**, display module **126**, selection module **127**, candidate administration module **131**, and candidate DB **132**.

15 Communication means usable at the user terminal are reported from the communication administration module **121** to the candidate administration module **131**, and stored in the candidate DB **132**. When the user specifies a destination user, the list of communication means usable by both the

20 originating and destination user (the candidate list) is sent from the candidate administration module **131** to the acquisition module **124**, and displayed at the user terminal by the display module **126**. If the destination user has a plurality of terminals, the candidate list is displayed with

the communication means grouped by communication means category.

Employing this notification system enables the destination user terminal to be selected according to the destination user's location or status. The source user does not engage in futile communication, and the destination user can receive a communication request at the information terminal that best fits his circumstances.

Configuration

Fig. 19 is a functional block diagram showing the structure of notification system 111 in accordance with the fifth embodiment. This notification system consists of the user terminal 120 and server 130 connected by a network such as the Internet. Furthermore, the drawing shows only one user terminal, but a plurality of user terminals is connected to the server.

(1) User Terminal

The user terminal has a communication administration module 121, designation module 123, acquisition module 124, display module 126, and selection module 127. The communication administration module 121 reports communication means that the user terminal has to the server. In this example the communication administration module 121 receives notification of the communication means selected by the source user from the server, and starts that

communication means. In addition, the communication

administration module **121** has the function of reporting

communication means status to the server. The communication

administration module **121** preferably also has supplementary

5   functions in addition to the communication means reporting

function and starting function. These supplementary

functions shall be described later.

The designation module **123** receives the destination

user designation from the user and reports it to the server.

10   The acquisition module **124** acquires the list of

communication means usable by both the source user and

destination user--that is, the candidate list--from the

candidate administration module **131**. The display module **126**

displays the candidate list on the user terminal. The

15   selection module **127** reports the communication means

selected from the candidate list to the candidate

administration module **131**.

(2) Server

The server has candidate administration module **131** and

20   candidate DB **132** and group DB **134**. Based on reports from

the communication administration module **121**, the candidate

administration module **131** stores user terminals and

communication means usable at those terminals in the

candidate DB **132**. The candidate administration module **131**

25   has grouping module **301**. Using this, it refers to candidate

DB **132** and groups the communication means at each terminal

belonging to a single user by communication means category,

and stores the results in group DB **134.**

The candidate administration module **131** also obtains

5 communication means usable by the designated destination

user and communication means usable by the source user from

the group DB **134** and creates the candidate list, and reports

it to the source user. Further, the candidate

administration module **131** preferably has other supplementary

10 functions. Supplementary functions of the candidate

administration module **131** shall be described later.

Fig. 20 is a summary drawing explaining the data stored

in the candidate DB **132.** The candidate DB **132** stores user

name, communication means, "usable?," update time,

15 communication status, and message. "User name" preferably is

information that can specify a user; user ID may also be

used. "Communication means" records the type of

communication means and the terminal name. For example, "IM

@ Office" indicates instant message in a terminal at the

20 office.

"Usable?" records information indicating whether or not

a communication means at the user terminal is usable.

"Update time" records the latest update time for this entry.

"Communication status" records the status of the

25 communication means: "active," "standby," "communication

requested." "Message" records a message the user has set

for the communication means. In Fig. 20 the message "I'm

here" has been set for the communication means "IM @

Office."

5   Fig. 21 is a summary drawing explaining the data stored

in the group DB **134**. Among the communication means stored

in the candidate DB **132**, those communication means that are

in "usable" status are grouped by predetermined criteria and

recorded in the group DB **134**. In this example communication

10   means functions are utilized by the grouped criteria. User

name, communication type, link, priority ranking, and

preference information are stored in the group DB **134**.

As with user name in the foregoing candidate DB **132**,

"user name" is information that specifies the user.

15   "Communication type" records the function of the

communication means. In Fig. 21 the communication means

functions are shown as messaging, NetMeeting, FileTransfer,

and telephone. "Link" records a combination of user

terminal and communication means at that terminal, or

20   communication means. For example, in Fig. 21 the

communication means that can use the messaging function for

user A are "IM @ office/lab" or "e-mail."

"Priority ranking" records the priority ranking

assigned to communication means having the same

25   communication function. Priority ranking is information

that is not always necessary in the group DB **134.** Priority

ranking may be assigned by the user, as will be described

later. It may also be assigned by the server according to

user status when the candidate DB **132** records the user

5 status (equivalent to the list DB) as in the first

embodiment.

"Preference information" records information specifying

the user and the communication means most recommended by

that user. In Fig. 21 user A recommends that user "nkawa"

10 use IM @ office/lab" and that user "kohda" use "e-mail" for

the messaging function. The communication means recommended

by each user is also prioritized by the "priority ranking"

setting.

(3) Communication Administration Module Supplementary

15 Functions

As noted earlier, the communication administration

module **121** preferably has supplementary functions. In this

example the communication administration module **121** has a

confirmation module **201**, editing module **202**, storage module

20 **203**, status reporting module **204**, contents sending module

205, contents DB **206**, history acquisition module **207**, and

terminal communications module **208** for implementing

supplementary functions.

Before communication begins, the confirmation module

25 **201** obtains the source user's approval and then

communication occurs. When a communication function is selected, the confirmation module **201** reports to the user via the server that the communication function is being used. In addition, the confirmation module **201** receives

5   approval of the communication and communication occurs with the responding user terminal.

The editing module **202** receives user editing of the previously described group DB **134** or the message for a communication means and sends it to the server. A user can

10 use the editing module **202** to group communication means at the local terminal or add messages to communication means. The messages set for communication means are stored in the storage module **203** as a message list. In addition, the editing module **202** preferably is able to receive user

15 changes in whether or not an operable communication means at the other user's terminal can be used, and send these to the server.

The storage module **203** stores the message list. Fig. 22 is a conceptual diagram explaining the message list.

20 Communication means and messages set by the user are associated and stored in the message list. In addition to the message list, the storage module **203** stores specific information such as the name of the user terminal. A terminal name is "office" or "lab," for example, and is

information for distinguishing among user terminals. The user uses the editing module **202** to set a terminal name.

The status reporting module **204** reports communication status of the communication means at the user terminal to the server. The "communication status" of the candidate list is updated according to this report. The status reporting module **204** also acquires the communication status at the user's other terminals and reports this to the server.

The contents sending module **205** stores specific information, including communication contents, in the content DB **206** when communication is executed by a communication means that the user terminal has. Fig. 23 is an explanatory diagram summarizing the information stored in the content DB **206**. The content DB **206** stores communication means, communication contents, start time, end time, and messaging party. "Communication means" records both the communication means and terminal name. "Communication contents" records the data sent and received. For example, if the communication means is instant message (IM), the contents of the message are recorded in the communication contents. "Start time" and "end time" record the communication start and end time respectively. "Messaging party" records the source user.

The contents sending module **205** also sends specific information, including communication contents, to other terminals of the same user via the server. This makes it possible for the user to acquire communication contents that

5   occurred at his terminal **1a** at another of his terminals, **2a**.

The terminal communications module **208** detects other user terminals near the local terminal by wireless means. For example, a detection data string is sent by wireless means, and a data string in response to this is received,

10   thus detecting the other terminal.

The history acquisition module **207** acquires the user's communication history from the server's history DB **305**, to be described later, and reports this to the user.

The terminal communications module **208** establishes a

15   data link between the local terminal and the other terminal when another terminal is detected. Then data is transferred, with the terminal used by the user as the master side and the other terminal as the slave side. The master terminal communications module **208** asks the slave

20   terminal communications module **208** to report the terminal name and usable communication means. In addition, the master terminal communications module **208** uses the response to this request and reports to the server, with the slave terminal's communication means forming a module of the

25   master's communication means. All data to be sent and

received between the slave terminal and the server is relayed using the master terminal communications module **208**. If the terminal communications module **208** function is used, when a single user uses a plurality of terminals the usable

5 communication means at the currently used terminal and at other terminals can be included in the candidate list.

(4) Server Supplementary Functions

As described previously, the server preferably has supplementary functions. In this example the server has a

10 confirmation sending module **302**, status acquisition module **303**, log module **304**, and history DB **305** for executing supplementary functions.

The confirmation sending module **302** is provided in the server to correspond to the confirmation module **201** in the

15 communication administration module **121**. The confirmation sending module **302** sends a receipt confirmation for all usable communication means selected as a communication function by the source user. The confirmation sending module **302** also sends the source user terminal an answer

20 with regard to receipt confirmation.

The status acquisition module **303** is provided in the server to correspond to the status-reporting module **204** in the communication administration module **121**. The status acquisition module **303** receives communication status from

25 the user terminal and updates the candidate DB **132**'s

"communication status." Also, the status acquisition module **303** reports changes in the status of communication means at other user terminals to the same user's terminal.

The log module **304** stores the names of communication means started and finished at each user terminal in the history DB **305** in accordance with communication status from the user terminal. The history DB **305** may also store communication contents too. In response to a request from the user terminal, the log module **304** reads the user's communication history from the history DB **305** and sends it to the requesting user terminal.

Process Flow

Next, the processing flow in a notification system that has the previously described functions shall be explained in detail.

(1) Main Process

Fig. 24 is a diagram explaining the main processing flow in the notification system of this embodiment. In this process, the source user selects a communication function—that is, a group of communication means—and requests communication.

First, at startup, the notification device reports communication means the local terminal has to the server (#101, #102). Also, if a communication means becomes usable

or unusable, the notification device reports the new status to the server (#101, #102).

The server updates the candidate DB **132** based on the report from the user terminal (#103, #104). In addition, the server groups communication means and updates group DB **134** based on the new contents of the candidate DB **132** (#105, #106). For example, in the candidate DB **132** shown in Fig. 21 suppose "IM @ Office" changes from "usable" to "unusable." In this case, the messaging "IM @ Office" is deleted from the group DB **134** shown in Fig. 22.

When any user is specified as the destination user, the server reads the group DB **134** for the destination and source users, creates a candidate list, and sends it to the source user terminal (#107, #108, #109). If a priority ranking or preference is set in the group DB **134**, the communication means described in the candidate list are determined based on this information. It is also possible to make a communication means' priority higher according to the latest update time in the candidate DB.

For example, the server lists only the communication means with the highest priority for the source user within the same group on the candidate list. Communication means usable by both users are grouped by each communication function and displayed at the source user terminal (#110,

#111). Examples of displayed candidate lists are the screen samples shown in the previously described Fig. 7 and Fig. 8.

When the source user selects any of the communication means from the displayed candidate list, the communication means is started at the user terminal (#112, #113). Meanwhile, the selected communication means is reported via the server to the destination user terminal (#114, #115).

The destination user terminal starts the communication means in accordance with the communication means report (#116, #117).

In this process, assigning correspondences to the users administrates user communication means existing diversified among a plurality of terminals. Therefore the user can easily know what communication means are present at the other user's plurality of terminals, and smooth communication is possible.

(2) Confirmation Process

Fig. 25 is a diagram explaining the confirmation processing flow performed by the notification system. In this processing, communication begins after confirming the destination user's intent.

The source user specifies a destination user and selects a communication means from the candidate list (#121-#125). This processing is the same as #107-#112 in the foregoing main process. The server sends a reception

confirmation to all destination user terminals that can use the selected communication means (#126, #127).

The source user and the communication means are reported to the destination user terminal that received this (#128, #129). For example, a message such as "User A wants to telephone you. Do you want to communicate?" is displayed at the terminal. The destination user terminal waits for a designated time for a user response to this message, and reports the response to the server (#130, #133). If there is no response within the designated time, nothing happens (#131, #132).

Upon receiving a response, the server reports the response contents to the source user terminal (#134). Fig. 25 diagrams the routine when the response is "communicate." In this case, the server reports the name of the terminal that responded to the source user terminal (#134, #135). The source user terminal starts communication with the reported terminal using the selected communication means (#136, #137).

Furthermore, if the response is "don't communicate," the source user terminal reports the response contents to the user.

(3) Communication Status Broadcast Process

Fig. 26 is an explanatory diagram showing the flow of communication status broadcast processing performed by the

notification system. In this process, the communication status of user terminal a1 is broadcast to the user's other terminals: a2, a3 . . .

User A has a plurality of terminals: a1, a2, a3 . . .
5 When some sort of change in communication status occurs at a certain terminal a1, this change is reported to the server (#141, #142). For example, terminal a1 has a telephone call, or an instant message is received.

Based on this report, the server reports the terminal name, communication means, and new communication status to user A's other terminals: a2, a3... (#143, #144). Based on this report, the other terminals a2, a3... report the change in communication status at terminal a1 (#145, #146). For example, they display a message such as "Terminal a1 has received a telephone call."

(4) Communication Content Acquisition Process

Fig. 27 is a diagram illustrating a communication content acquisition routine performed by the notification system. In this process user A acquires the contents of communication conducted at his own terminal a2 at another of his terminals a1 via the server.

First, user A designates one of his plurality of terminals (a2), and requests the contents of communications conducted at that terminal (#151). The server relays the request to the specified terminal a2 (#152).

The designated terminal a2 performs the designated authorization processing with terminal a1, and confirms whether or not the requestor has the right to acquire the communication contents (#153, #154). If authorized,

5   terminal a2 requests search conditions (#155). For example, it requests conditions such as a range of communication start times, the messaging party, or communication means, for extracting data from the contents DB **206**. On the other hand, if not authorized, the authorization result is

10   reported to terminal a1 via the server (#156).

Terminal a1 receives input of search conditions from the user and sends them to terminal a2 via the server (#158, #159, #160).

Terminal a2 searches the contents DB **206** based on the

15   designated search conditions, extracts data, and sends it to terminal a1 (#161, #162, #163). For example, if a range of communication start times is designated, the contents of communication that began during that range are read and sent to the terminal a1. In addition to communication contents,

20   the extracted data can be information stored in the contents DB **206**. In this way user A can acquire at different terminal a1 the content of communications conducted at terminal a2, or the messaging party.

(5) Communication Log Acquisition Process

Fig. 28 is an explanatory diagram showing communication log acquisition process performed by the notification system. In this process user A can acquire the history of communications at his plurality of terminals a1, a2, a3...

5 at any of his terminals.

When user A requests the communication log at any terminal a1 (#171), the server decides whether or not the user has the right to acquire the communication history using a predetermined authorization process (#172, #173).

10 If the user is authorized, the server reads the communication log at all terminals of the relevant user from the history DB **305** and sends it to the requesting terminal a1 (#174, #175). The communication log at all of user A's terminals is displayed at terminal a1 (#176). If not

15 authorized, the server sends a predetermined message to the requesting terminal a1, for example, and terminal a1 reports to the user that it is not authorized (#177).

Sixth Embodiment

(A) In the foregoing fifth embodiment a single user's

20 communication means were grouped by communication means function, but they may also be grouped by other criteria.

Other Embodiments

(A) The foregoing first through sixth embodiments were individually explained, but it is possible to appropriately

25 combine and practice each embodiment.

(B) Recording media recording programs for executing the methods described in the foregoing first through sixth embodiments are included in the present invention. Examples of these recording media include computer-readable floppy

5   disks, hard disks, semiconductor memories, CD-ROMs, DVDs, magneto-optical disks (MO).

(C) A transmission medium transmitting a program for executing the previously described inventive methods is also included in the present invention. Examples of this

10   transmission medium include transmission media (optical fibers, wireless circuitry) in computer network systems (LANs, the Internet, wireless communication networks) for transmitting and providing program information as carrier waves.

15   (D) A server that provides a program for executing the previously described inventive methods using the foregoing transmission medium is also included in the present invention.

Utilizing the present invention notifies a user after

20   selecting a communications partner of communication means usable by both the other party and the user. This makes it possible to select a communication means taking into account not just the other party's circumstances but also the user's own circumstances, so convenience to the user who is trying

25   to initiate communication is increased. Further, not only

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communication means already present at a user terminal, but communication means that are available through downloading can be selected. In addition, wherein user have communication means at a plurality of terminals, the

5   communication means at each terminal are administered by correlating to the users, and therefore the source user can communicate by communication means on his terminal that are most convenient for the destination user.

While only selected embodiments have been chosen to

10   illustrate the present invention, to those skilled in the art it will be apparent from this disclosure that various changes and modifications can be made herein without departing from the scope of the invention as defined in the appended claims. Furthermore, the foregoing description of

15   the embodiments according to the present invention is provided for illustration only, and not for the purpose of limiting the invention as defined by the appended claims and their equivalents.